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RHODE ISLAND'S HEALTH 1988

OFFICE OF HEALTH STATISTICS
RHODE ISLAND DEPARTMENT OF HEALTH

To

The Honorable Edward D. DiPrete, Governor

and

Members of the General Assembly

At this time I respectfully submit to you Rhode Island's Health, a report on the health of the people of Rhode Island. This publication is the tenth published under this title which describes the health of the state's population. Rhode Island's Health is intended to help identify strengths and weaknesses in the health status of Rhode Islanders as well as in the health care resources available to serve them. The information presented can help in determining health priorities and monitoring progress in promoting health and improving access to affordable, high-quality health care.

Most of the data presented here result from the cooperative efforts of public and private agencies under the leadership of the Rhode Island Department of Health. Rhode Island's comprehensive health database has been maintained over many years. As needs change and new needs arise, a continuing commitment to its maintenance and extension is required. Timely, accurate information is essential to the evaluation of these needs.

We can be proud that Rhode Island is disinguished as a leader in health statistics and their application to public health and safety. These strengths rest largely on the sound foundation provided by our cooperative health database. The Department of Health expresses its appreciation to the many organizations whose efforts support the data capabilities which have contributed to this edition of Rhode Island's Health.

H. Denman Scott, M.D., M.P.H.
Director of Health

Acknowledgements

This edition of Rhode Island's Health presents data on the health status of the people of the state and on the state's health care system over the past decade. In 1978, the Department of Health began a health promotional effort entitled "A Healthier State in '88." This document looks back over the ten-year period since that effort to examine and discuss changes that have occurred in the health arena. Much of the information presented here is based on data appearing in the most recent issue of the Rhode Island Health Data Guide, which is available from the Office of Health Statistics, as are additional copies of Rhode Island's Health 1988.

The efforts of Miriam Campbell, Ph.D., consultant to the Office of Health Statistics and analyst and author of this report, are gratefully acknowledged. Special thanks are extended to John Tierney, Deputy Director, for his inspiration to look back over the progress made in the past decade relevant to health in Rhode Island and for his direction and support for the Rhode Island Health Data Guide. William J. Waters, Ph.D., Associate Director of Health (Health Policy) also provided leadership and input for this project. The efforts of many reviewers inside and outside the Department are also deserving of thanks. Finally, we are grateful to Wayne Aldrich and his staff for their usual fine printing job.

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February 1989

DEDICATION

This 1988 edition of Rhode Island's Health
is dedicated to the memory of

Joseph Cannon, M.D.
Director of Health, 1961-1984

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INTRODUCTION

This report, the tenth in the series Rhode Island's Health, highlights selected topics of current interest. In this publication, decade-long trends in three types of health conditions (major chronic disease mortality, mortality from injuries and violence, and childhood illnesses), health manpower, health plan enrollment, hospital length of stay, and the cost of inpatient services are discussed. Data are shown annually for the years 1977 through 1987. Mortality data for 1987 are adapted from unpublished tables provided by the Office of Vital Records, and some health plan enrollment figures were provided directly through correspondence. The remainder of data included here are derived from the fourth edition of the Rhode Island Health Data Guide, a recently published compendium of health information prepared by the Office of Health Statistics. Readers may obtain a copy of that document from the Office of Health Statistics, 401-277-2550.

Causes of death for all years shown are grouped according to the ninth revision of the International Classification of Diseases, ICD-9. The specific codes for each disease category described in this report are shown in the Appendix. Adjustments to the eighth revision (in use 1968-1978) were made via published comparability ratios (National Center for Health Statistics, 1978; Rhode Island Department of Health, 1988).

Tables throughout the text are organized with the most current year of data shown to the left. This presentation, which follows the format of the series Vital Statistics Annual Report of the Rhode Island Department of Health, is designed to lead the eye of the viewer to the most recent data.

Rhode Island's Health 1988 is the most current contribution to the series, aiding legislators and other concerned citizens to get an overall picture of the health of Rhode Islanders. The series as a whole serves to clarify aspects of complex health issues, so that interested citizens may help guide the course of public health.

I. Major Chronic Disease Mortality

Of the top ten causes of mortality in Rhode Island in 1986, six were chronic diseases*. Of the top five causes, all but one -- unintentional injuries ("accidents")-- were chronic conditions. This prominence of the chronic diseases arose with the conquest of the common infectious diseases in the early part of this century. With the exception of the spectre of AIDS, the face of mortality in the next century will likely be the one we tend to see today: an elderly person with one or more long-standing conditions.

Yet in the past twenty years, improvements in medical technology, treatment, and lifestyle changes have resulted in a postponement of mortality to ever later ages. Much current debate in the health professions concerns the quality of life of ever more elderly individuals and the high potential cost of caring for growing numbers of mentally and/or physically disabled individuals in the twenty-first century.

Table 1. Cause-Specific Mortality from the Major Chronic Diseases in Rhode Island, 1977-1987

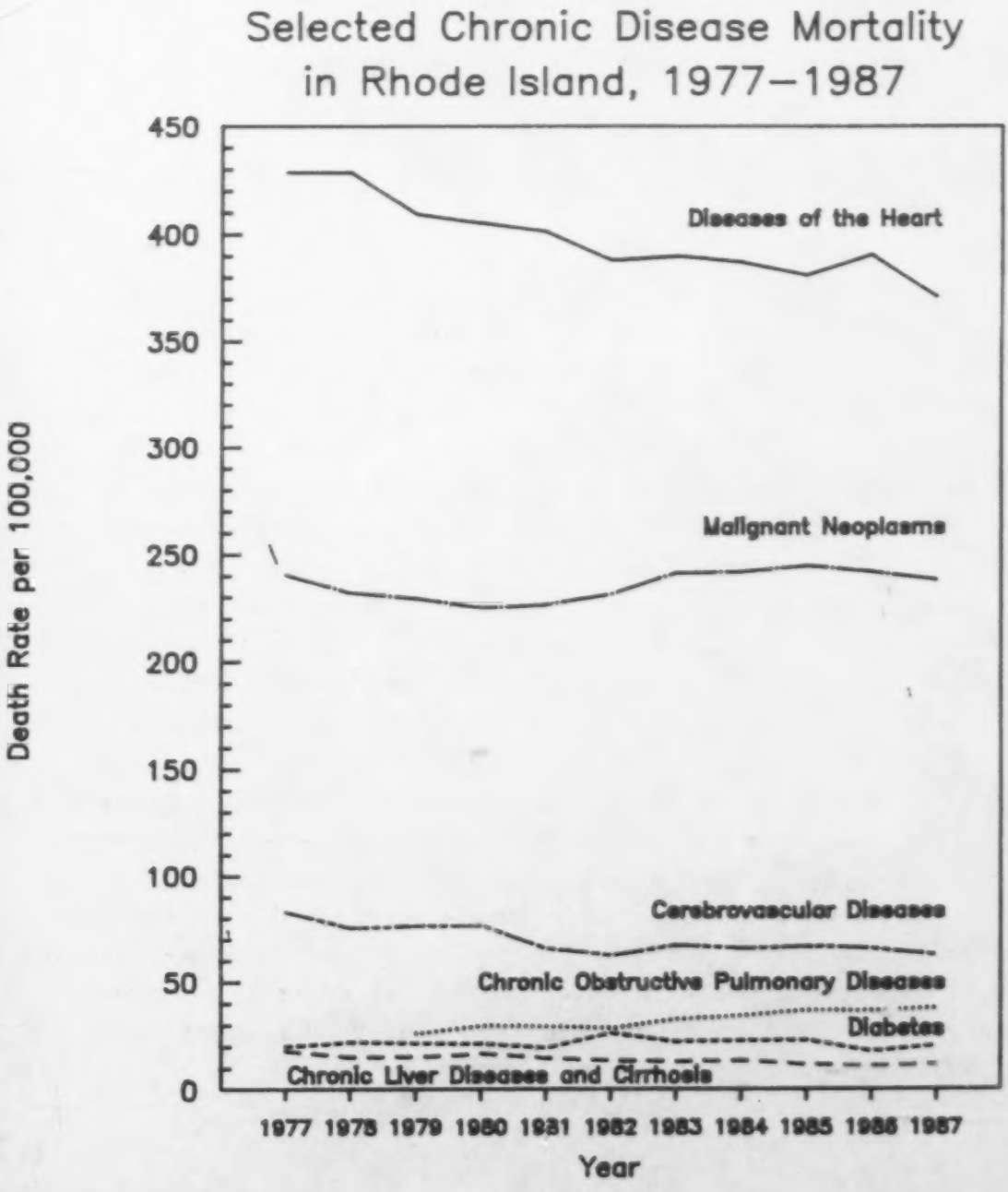
Rank in 1986	Cause of Death	Rates per 100,000 Population by Year										
		1987	1986	1985	1984	1983	1982	1981	1980	1979	1978	1977
1	Diseases of the Heart	370.4	390.3	380.5	386.5	389.5	387.5	400.5	404.5	408.7	427.8	428.1
2	Malignant Neoplasms	237.5	241.3	244.3	241.6	241.0	231.1	226.1	224.6	228.6	231.5	239.9
3	Cerebrovascular Diseases	62.2	65.3	66.6	65.4	67.0	62.1	65.3	76.3	76.2	75.0	82.6
4	COPD+	37.7	36.3	36.5	34.0	32.4	28.2	28.9	29.5	25.7	N.A.	N.A.
7	Diabetes Mellitus	20.4	17.5	22.8	22.6	21.8	26.3	19.0	21.0	21.3	21.9	19.8
9	Chronic Liver/Cirrhosis	11.8	10.7	11.3	13.3	12.7	13.2	14.2	16.6	15.0	14.7	17.6

In general, progress in chronic disease mortality in Rhode Island between 1977 and 1987 as in the United States as a whole is the story of a continuing decline in the leading cause of death, diseases of the heart (commonly called heart attack or coronary).

*The exceptions are unintentional injuries; pneumonia and influenza; septicemia; and tied for tenth: suicide and nephritis, nephrotic syndrome and nephrosis.

+Comparability ratios for this category were unavailable.

Between 1977-1981 and 1983-1987, the death rate from this cause in Rhode Island declined by seven percent. In terms of loss of life, approximately 351 Rhode Islanders did not die in 1987 who would have died if conditions for these diseases in 1977 had prevailed.



Cerebrovascular diseases or stroke, the third leading cause of death in 1987, also continued its downward trend during the past decade. The five-year average crude death rate from this cause fell by 13 percent from 1977-1981 to 1983-1987.

A major factor implicated in the decline in both heart and cerebrovascular diseases is the reduction in smoking among the population. Smoking was responsible for about 21 percent of all coronary heart disease mortality and 18 percent of all stroke deaths in 1985 (United States Dept. of Health and Human Services, 1989). The percentage smoking among those over 15 years of age declined from 39 percent in 1975 to 30 percent of the population in 1985 (Campbell, Reilly and Buechner, 1986).

The crude death rate from malignant neoplasms has fluctuated slightly in the 1980s. Although five percent lower on average in the period 1978-1982 than in 1987, the rate has hovered around 240 deaths per 100,000 population throughout the 1980s. Malignant neoplasms are responsible for more loss of life in Rhode Island than all other causes except heart disease and are among the top five causes of death in all age groups. Malignant neoplasms are fifth in loss of life among those under 20 years of age, second among those 20-44 or over 64 years, and first among those aged 45-64 (Rhode Island Department of Health, 1988). This significance throughout the life cycle differentiates cancers from other leading causes of mortality with the exception of unintentional injuries.

The fourth leading cause of death, chronic obstructive pulmonary disease (COPD), is comprised of chronic respiratory conditions such as bronchitis, emphysema and asthma. Much of the mortality from this cause can be attributed to lung damage associated with smoking or other environmental pollutants. A disease almost exclusively of the elderly, the crude death rate for COPD has been on the increase throughout the 1980s. The crude rate rose nearly 50 percent from 1979 to 1987.

Diabetes mellitus, the seventh leading cause of death, is a chronic metabolic disorder whose debilitating complications can be prevented or mitigated through appropriate treatment and diet. Mortality from diabetes, similarly to malignant neoplasms, has fluctuated throughout the period in question. The crude death rate in 1987 was 20 per 100,000, identical to the rate in 1977.

Chronic liver disease and cirrhosis are often associated with alcoholism, but these conditions have many causes, including hepatitis, nutritional deficiency, and biliary obstruction. Nearly sixty percent of the deaths attributed to chronic liver disease and cirrhosis in 1986 occurred to those over 64 years of age. There has been a marked decline in deaths from these causes in the past decade, from a crude rate of 18 per 100,000 in 1977 to about 12 per 100,000 in 1987. Coincident with the decrease in mortality, the average age at death from these liver diseases has risen (Rhode Island Department of Health, 1988).

The decline in cirrhosis mortality has not been adequately examined. Analysis of alcohol consumption in the United States indicates that the trend in cirrhosis mortality has been independent of alcohol use (Centers for Disease Control, 1986). The Centers for Disease Control (CDC) has suggested a number of possible explanations, including earlier diagnosis, improvement in the medical management of the disease, decreased use of the diagnostic code for chronic liver disease and cirrhosis, reduction in incidence of the causes of cirrhosis not associated with alcohol abuse, and a decrease in the incidence of other conditions co-morbid with cirrhosis that would tend to lengthen survival time for cirrhosis patients (CDC, 1986). It should be noted that factors tending to increase survival time (such as earlier diagnosis with improved medical management and a decline in co-morbidity) would tend to raise the average age at death from cirrhosis, consistent with the trend in Rhode Island.

II. Mortality from Injuries and Violence

Both unintentional injuries (also known as "accidents and adverse effects"*, e.g., falls and automobile accidents) and violence (homicide and suicide, also known as intentional injuries) are causes often associated with premature loss of life and high risk-taking behavior. The Rhode Island Department of Health has recommended that rates from these causes together should be reduced by ten percent from 1983 levels by 1992. Recent research in injury control has acknowledged that "accidents" are no accident, that is, that behavior and life style predict the likelihood of injury. Such research has paved the way for heightening awareness of the means to prevent injury through public health education and regulation.

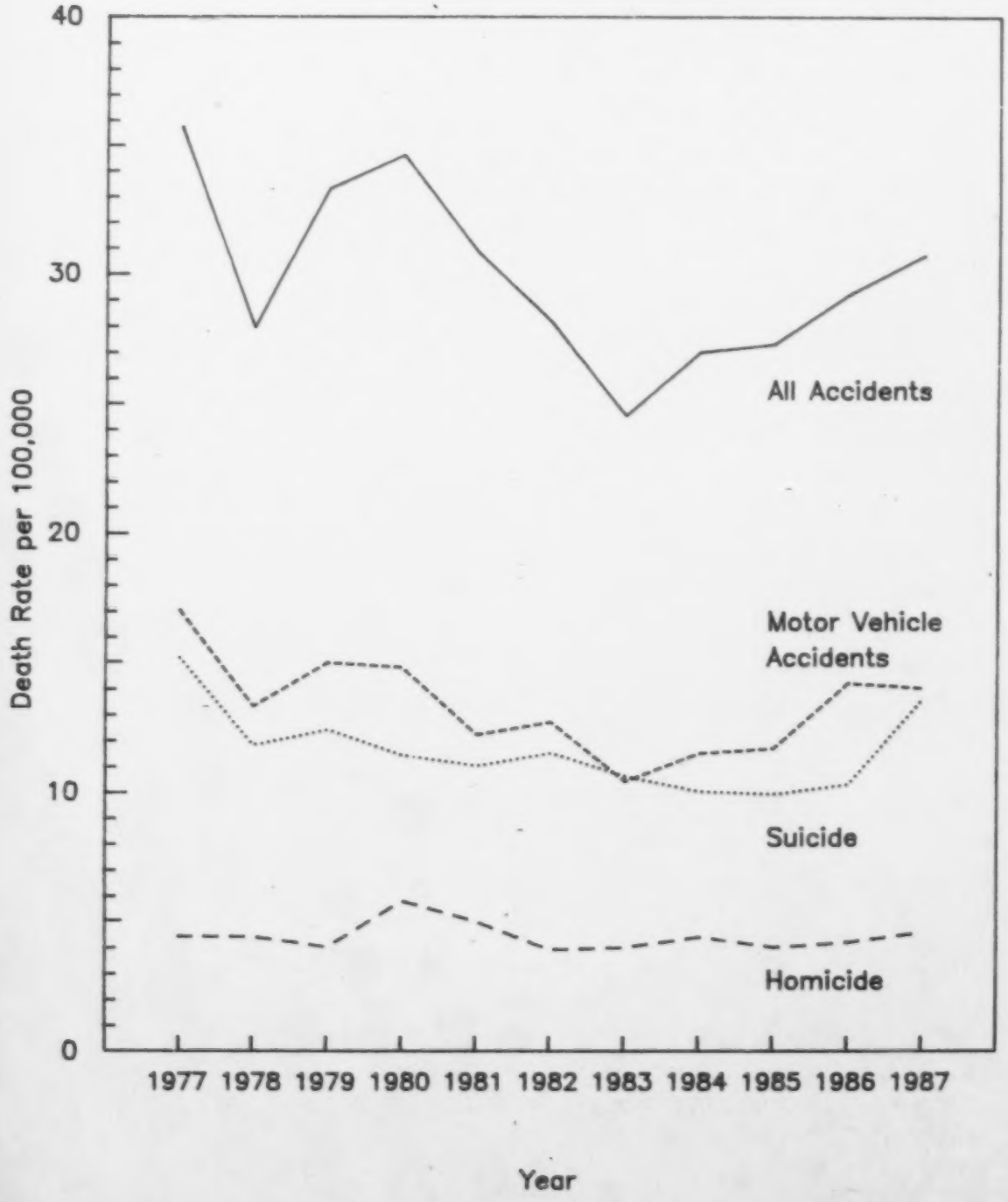
Table 2. Cause-Specific Mortality from Injuries and Violence for Rhode Island, 1977-1987

Rank in 1986	Cause of Death	Rates per 100,000 Population by Year										
		1987	1986	1985	1984	1983	1982	1981	1980	1979	1978	1977
5	Accidents and Adverse Effects	30.7	29.2	27.3	27.0	24.5	28.1	30.8	34.6	33.3	27.9	35.7
N.A.	Motor Vehicle	14.0	14.2	11.7	11.5	10.4	12.7	12.2	14.8	15.0	13.3	17.0
10	Suicide	13.6	10.3	9.9	10.0	10.6	11.5	11.0	11.4	12.4	11.8	15.2
15	Homicide and Legal Intervention+	4.6	4.2	4.0	4.4	4.0	3.9	5.0	5.8	4.0	4.4	4.4

Mortality from unintentional injuries fluctuated widely between 1977 and 1987, with peaks in 1980 and 1987 and troughs in 1978 and 1983. Between 1980 and 1983 the unintentional injury mortality rate dipped nearly ten percent per year; since 1983 the rate has been climbing six percent annually on average, or 25 percent overall between 1983 and 1987.

*The term "adverse effects" refers to the damaging effects of accidental overdoses of medication.
+The term "legal intervention" refers to injuries inflicted by a law enforcement officer in the course of duty.

Mortality from Unintentional Injuries and Violence in Rhode Island, 1977–1987

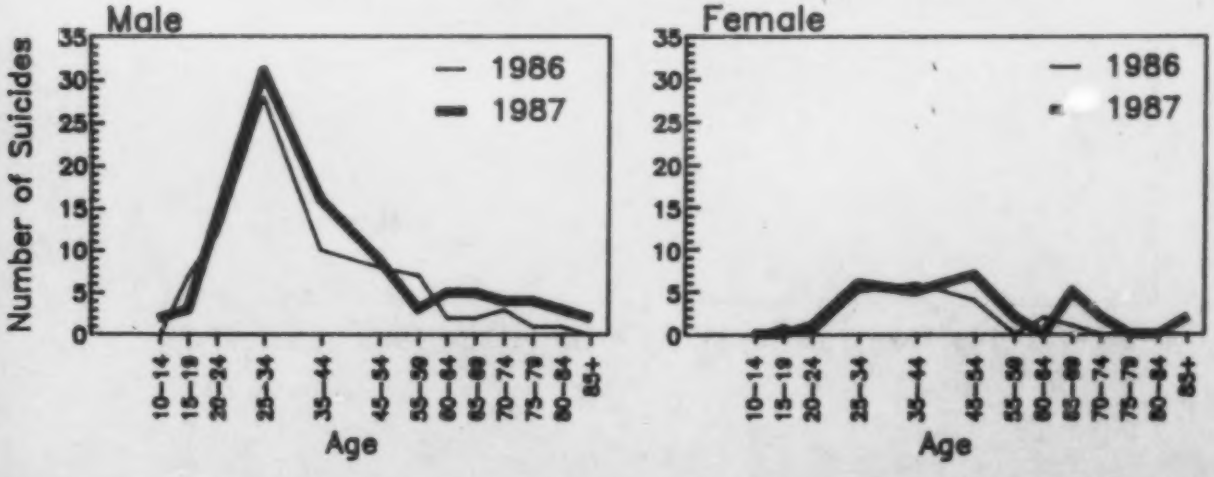


Motor vehicle accidents (MVA), the largest category within the group "accidents and adverse effects", mirrors the inclusive classification, although to a lesser degree. Therefore, major dips in the risk of an MVA death occurred in 1978 and 1983. In the four years since 1983 the fatality rate in motor vehicle accidents has risen 35 percent, from 10.4 per 100,000 to 14.0 per 100,000 in 1987.

The mortality rate from homicides also rose to an unusual degree from 1979 to 1980. In 1980 the murder rate was 45 percent higher than in the previous year. Following this high, the rate subsided to a level around four per 100,000. The 1987 figure was slightly higher however, 4.6, which may presage another rise in the homicide rate.

Suicides follow a different pattern from other injury-related mortality. Throughout the 1980s the rate fell gradually, about 3.5 percent on an annual basis between 1977 and 1986. In the past year, however, the number of suicides rose by 34 percent, from 100 such deaths in 1986 to 134 in 1987. (The rate rose 32 percent.) This increase is striking; however, the small numbers of events

Changing Pattern of Suicide by Age and Sex in Rhode Island, 1986 and 1987



and the briefness of the period under observation limit the conclusions that can be gathered from these data.

For example, increases in suicides occurred among both males and females of differing age groups. About half of the increase by age occurred among Rhode Islanders over 64 years of age. While nearly 60 percent of the increase could be accounted for by males, whose risk of suicide is higher than that for females, the number of suicides among women nearly doubled, from 19 in 1986 to 33 in 1987.

It seems unlikely that a single trend could account for this increase at opposite ends of the life cycle. Alternately, these suicides might have been motivated primarily by personal or idiosyncratic reasons unrelated to any particular social phenomenon; the higher than normal number of suicides in 1987 might be nothing more than an anomaly. The suicide rate, however, bears watching.

Thus, the picture of injuries -- whether intentional or not -- indicates a great deal of work to be accomplished to achieve the prescribed goal. Rather than the decline which was to be the goal, injury mortality rates have been climbing since 1983, with the prospect of even higher accidental death, homicide and suicide rates in the future.

III. Incidence of the Common Contagious Diseases of Childhood

Most of the communicable diseases common to children that used to result in thousands of lost school days and some premature mortality may be are fairly rare today. Measles, mumps, pertussis (whooping cough), and rubella are virtually preventable through appropriate vaccination. The limited measles/rubella epidemics among older teens and college students of the 1970s were reminders of the continuing need to vaccinate according to federal guidelines.

Sufficient levels of immunity in the population from measles, mumps, rubella, and pertussis vaccine or disease had been attained by 1980 to reduce the medical caseload for these four diseases together below 50 per year. Since 1981 there have been fewer than 40 new cases reported each year, and it is hoped that continued

Table 3. Incidence of Common Diseases of Childhood, Rhode Island, 1977-1987

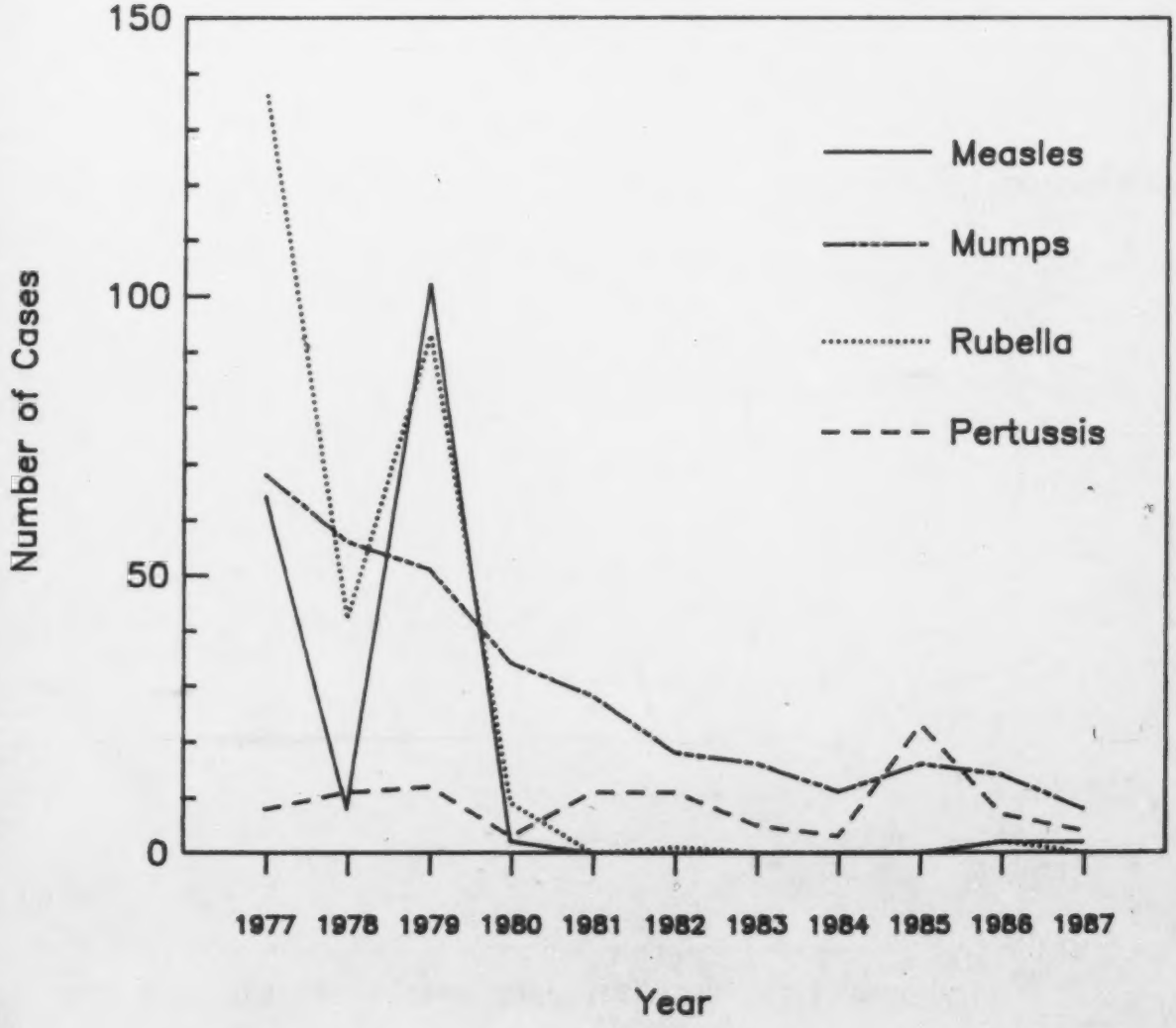
	Number of Reported Cases by Year										
Disease	1987	1986	1985	1984	1983	1982	1981	1980	1979	1978	1977
Chicken Pox	3,233	3,692	3,155	2,604	3,240	3,320	2,517	1,406	3,033	2,827	3,841
Measles	2	2	0	0	0	0	0	2	102	8	64
Mumps	8	14	16	11	16	18	28	34	51	56	68
Pertussis	4	7	23	3	5	11	11	3	12	11	8
Rubella	0	2	0	0	0	1	0	9	93	42	136

	Rate per 100,000 Children Aged 5-14 Years* by Year										
Disease	1987	1986	1985	1984	1983	1982	1981	1980	1979	1978	1977
Chicken Pox	2,671.9	3,076.7	2,607.4	2,134.4	2,612.9	2,614.2	1,936.2	1,033.8	2,426.4	2,141.7	2,803.6
Measles	1.7	1.7	0.0	0.0	0.0	0.0	0.0	1.5	81.6	6.1	46.7
Mumps	6.6	11.7	13.2	9.0	12.9	14.2	21.5	25.0	40.8	42.4	49.6
Pertussis	3.3	5.8	19.0	2.5	4.0	8.7	8.5	2.2	9.6	8.3	5.8
Rubella	0.0	1.7	0.0	0.0	0.0	0.8	0.0	6.6	74.4	31.8	99.3

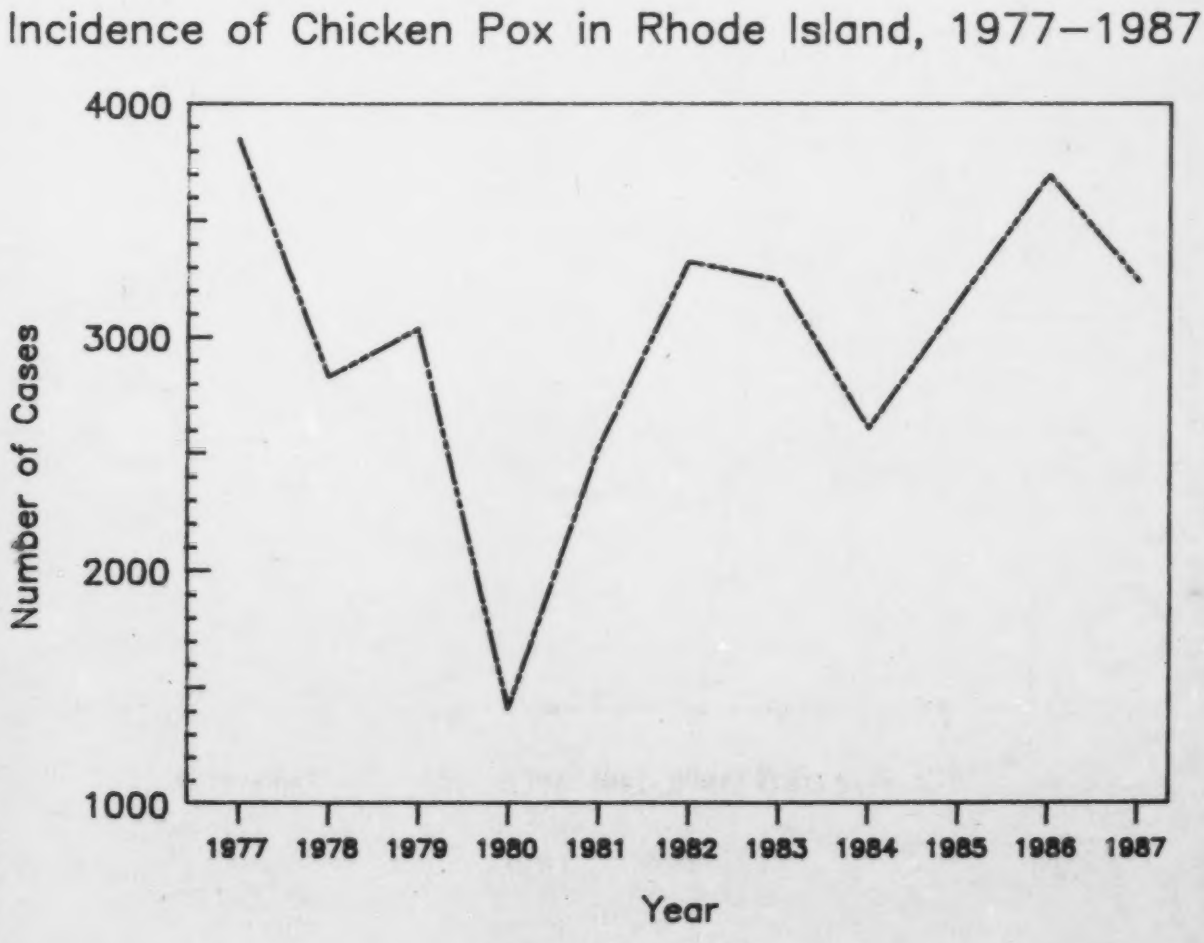
*Rates for 1977-1979 are per 100,000 children 5-13 years.

vigilance by educators, physicians, public health professionals, and parents will result in the eradication of measles before the year 2000.

Incidence of Selected Diseases of Childhood in Rhode Island, 1977–1987



Chicken pox (varicella) remains an endemic disease responsible for thousands of new cases each year. Chicken pox is commonly spread among preschool-age and school-age children, who comprise the bulk of those susceptible to the disease. By adulthood, most individuals have acquired immunity through previous exposure, although the disease may go unrecognized in the absence of the typical blisters. The rate in 1987, nearly 2,700 per 100,000 children 5-14 years of age, indicates that approximately three percent of all elementary school-age children exhibited the common blisters of chicken pox in that year.



IV. Number of Licensed Health Professionals

Employment in the health professions is expanding, as many college catalogs, newspapers, and trade publications will attest. In Rhode Island, as elsewhere, the evidence of the past decade is testament to the growth of this varied field of highly trained professionals.

Table 4. Number and Rate of Licensed Health Professionals by Type, Rhode Island, 1977-1987

Number of Licensed Health Professionals by Year

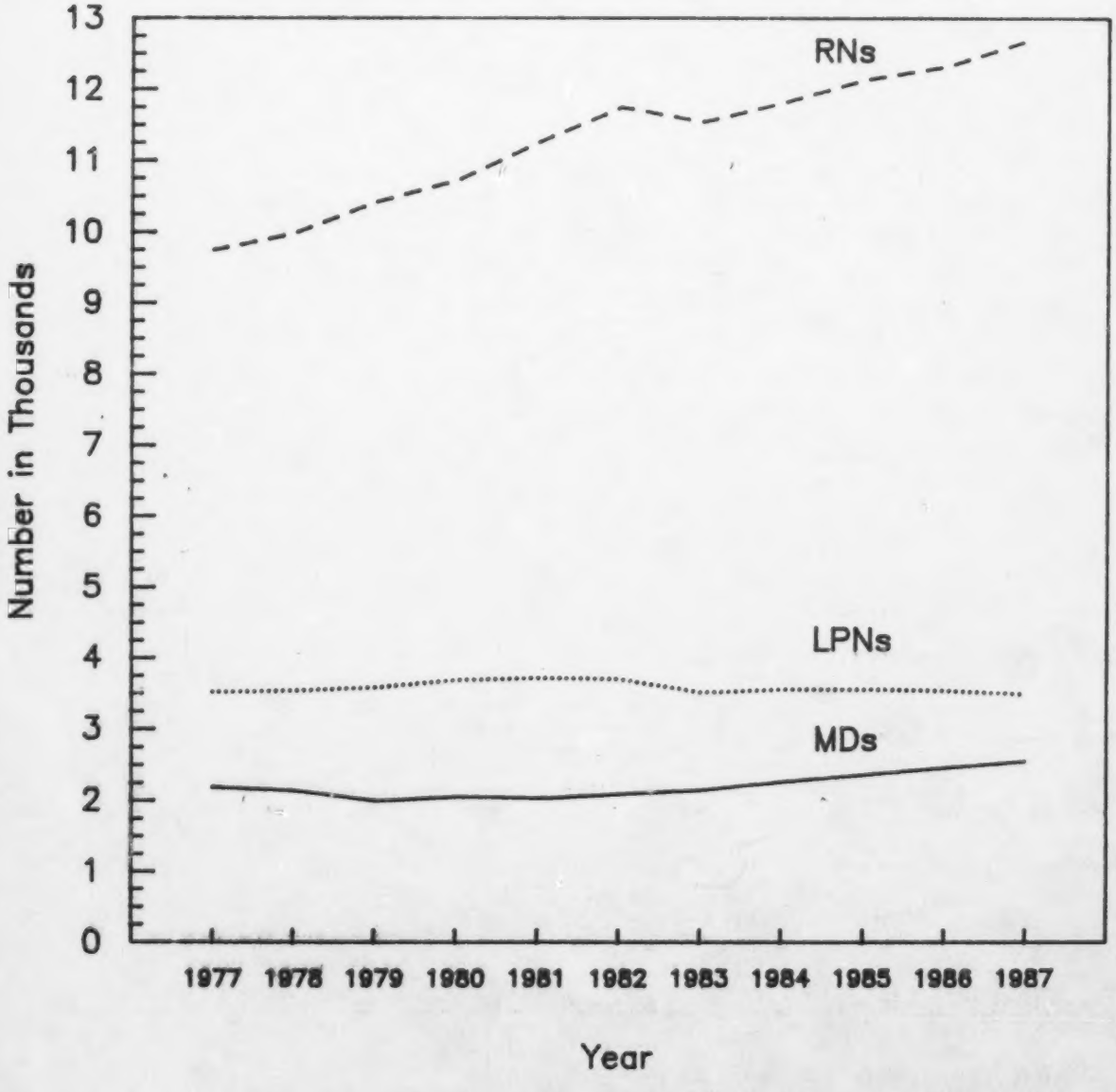
Health Profession	1987	1986	1985	1984	1983	1982	1981	1980	1979	1978	1977
Doctors of Medicine	2,547	2,457	2,358	2,258	2,142	2,087	2,021	2,050	1,982	2,123	2,172
Registered Nurses	12,662	12,294	12,109	11,787	11,503	11,717	11,230	10,691	10,387	9,949	9,706
Licensed Practical Nurses	3,478	3,524	3,548	3,550	3,506	3,695	3,716	3,686	3,581	3,533	3,517
Dentists	871	862	832	817	797	765	728	688	644	657	643
Dental Hygienists	619	601	560	526	509	460	417	400	351	337	332
Physical Therapists	400	344	372	339	332	317	290	251	233	214	192
Optometrists	158	156	148	148	153	147	146	144	144	143	158
Opticians	131	113	116	110	105	104	101	94	94	94	83
Osteopaths	119	107	104	99	93	93	89	96	100	115	113
Chiropractors	110	98	87	79	79	72	64	51	44	46	42
Midwives	11	15	10	11	11	9	9	5	6	*	*

Rate of Licensed Health Professional by Year

Health Profession	1987	1986	1985	1984	1983	1982	1981	1980	1979	1978	1977
Rates per 1,000 Population											
Doctors of Medicine	2.58	2.52	2.44	2.35	2.24	2.19	2.12	2.16	2.13	2.28	2.33
Registered Nurses	12.84	12.61	12.52	12.28	12.04	12.29	11.80	11.29	11.18	10.67	10.40
Licensed Practical Nurses	3.53	3.61	3.67	3.70	3.67	3.88	3.98	3.89	3.85	3.79	3.77
Rates per 100,000 Population											
Dentists	88.3	88.4	86.0	85.1	83.5	80.3	76.5	70.5	69.3	70.3	68.8
Dental Hygienists	62.8	61.6	57.9	54.8	53.3	48.3	43.8	42.2	37.8	36.0	35.6
Physical Therapists	40.6	35.3	38.5	35.3	34.8	33.3	30.5	26.5	25.1	22.9	20.1
Optometrists	16.0	16.0	15.3	15.4	16.0	15.4	15.3	15.2	15.5	15.3	16.9
Opticians	13.3	11.6	12.0	11.5	11.0	10.9	10.6	9.9	10.1	10.1	8.9
Osteopaths	12.1	11.0	10.8	10.3	9.7	9.8	9.3	10.1	10.8	12.3	12.1
Chiropractors	11.2	10.1	9.0	8.2	8.3	7.6	6.7	5.4	4.7	4.9	4.5
Midwives per 100,000 Women 18-44 Years	5.2	7.1	4.8	5.4	5.5	4.5	4.6	2.6	3.3	*	*

*Data not available

Licensed Physicians and Nurses in Rhode Island, 1977–1987



The demand for nurses has been growing, and the supply of licensed registered nurses (RNs) in Rhode Island has been on the rise in response. The number of RNs holding active licenses grew 30 percent between 1977 and 1987. Yet nationwide, over 11 percent of hospital staff nursing positions are vacant (Office of Health Planning, n.d.), and a survey in Rhode Island in 1987 indicated that less than 50 percent of a sample of RNs holding active licenses were working full-time (Campbell, 1988).

In addition, the number of licensed practical nurses (LPNs), of whom about 37 percent were working full-time in 1987, has been declining since 1984 (Campbell, 1988). Small but significant proportions of RNs and LPNs have left nursing to move into positions in other fields. These situations led to the convening in 1987 of a task force by the Director of Health to develop policy to counteract the nursing shortage.

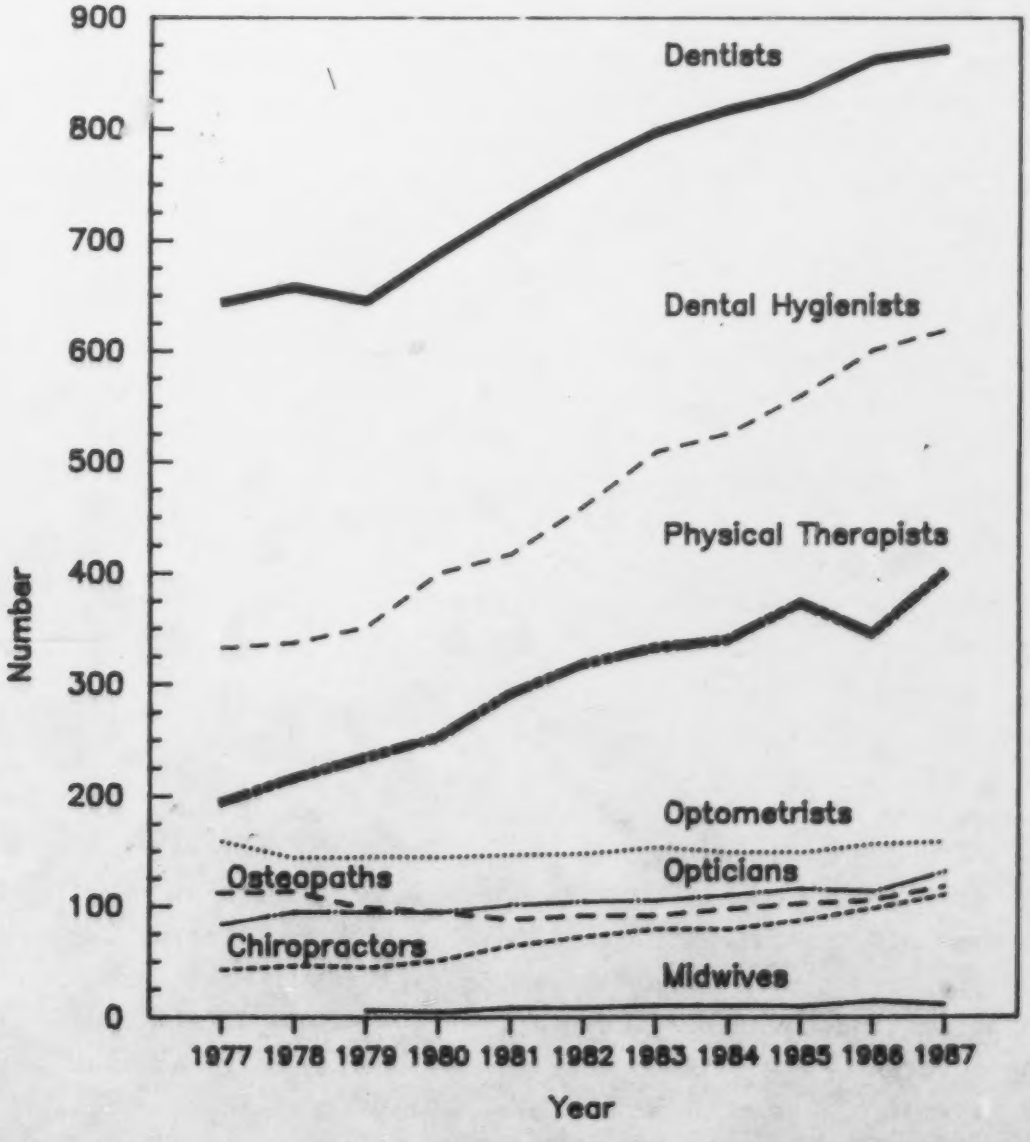
Between 1977 and 1987, an additional 375 doctors of medicine held a license to practice in Rhode Island. Most of the growth in the medical profession has been in specialty care areas. In fact, between 1980 and 1984 the number of general practitioners and specialists in family practice licensed in Rhode Island declined 32 percent, from 156 to 106 physicians (Campbell, 1987).

The number of licensed osteopaths declined during the early 1980s, but since 1983 there has been a gradual restoration to pre-1975 strength. As of 1987, there were 119 doctors of osteopathy holding active licenses in Rhode Island.

The number of individuals licensed to practice in many other health professions has expanded between 1977 and 1987. The number of dentists grew by one-third, and there were 86 percent more dental hygienists in 1987. The numbers of physical therapists and chiropractors each more than doubled in that time. Among the health professions examined, only optometry remained fairly stable, varying between 143 and 158 optometrists between 1977 and 1987. The numbers of opticians, individuals licensed to make and sell

eyeglasses, on the other hand, increased by over one-half by 1987. Even the rate of certified nurse midwives per woman in the childbearing ages nearly doubled, as the field of obstetrics expanded to include the trained midwife in its ranks in Rhode Island.

Other Health Professionals in Rhode Island, 1977–1987



V. Enrollment in Selected Health Plans

The past decade has seen the blossoming of the health maintenance organization (HMO) as an alternative to traditional health insurance plans, of which Blue Cross is the key representative. Rhode Islanders choose primarily between three health plans, with varying structures: (1) Blue Cross, in which the consumer may use a physician either affiliated or unaffiliated with the health plan who tends to be paid on a fee-for-service basis; (2) Rhode Island Group Health Association (RIGHA), an HMO in which consumers as members tend to receive their health care prepaid at specific plan centers from physicians who are employees of the plan; and (3) Ocean State Physician's Health Plan, an HMO that is an individual practice association in which members choose their caregiver, who is a participant in the plan and who provides service from his/her individual office for a set fee. Several other alternatives recently have become available to Rhode Islanders--e.g., MetLife and HMO-RI--but these have captured a small portion of the market to date.

Table 5. Enrollment in Selected Health Plans, Rhode Island, 1977-1987

Health Plan*	Year 1987	1986	1985	1984	1983	1982	1981	1980	1979	1978	1977
Blue Cross+	577,927	599,930	631,188	645,910	646,421	649,461	661,011	665,709	664,604	686,665	686,512
RIGHA	87,487	76,565	62,783	55,219	49,849	41,784	34,495	31,991	27,000	25,051	23,194
Ocean State	91,717	87,240^	42,762^	11,025	1,273	--	--	--	--	--	--
HMO-RI	2,447	240	--	--	--	--	--	--	--	--	--
Metlife	44~	--	--	--	--	--	--	--	--	--	--

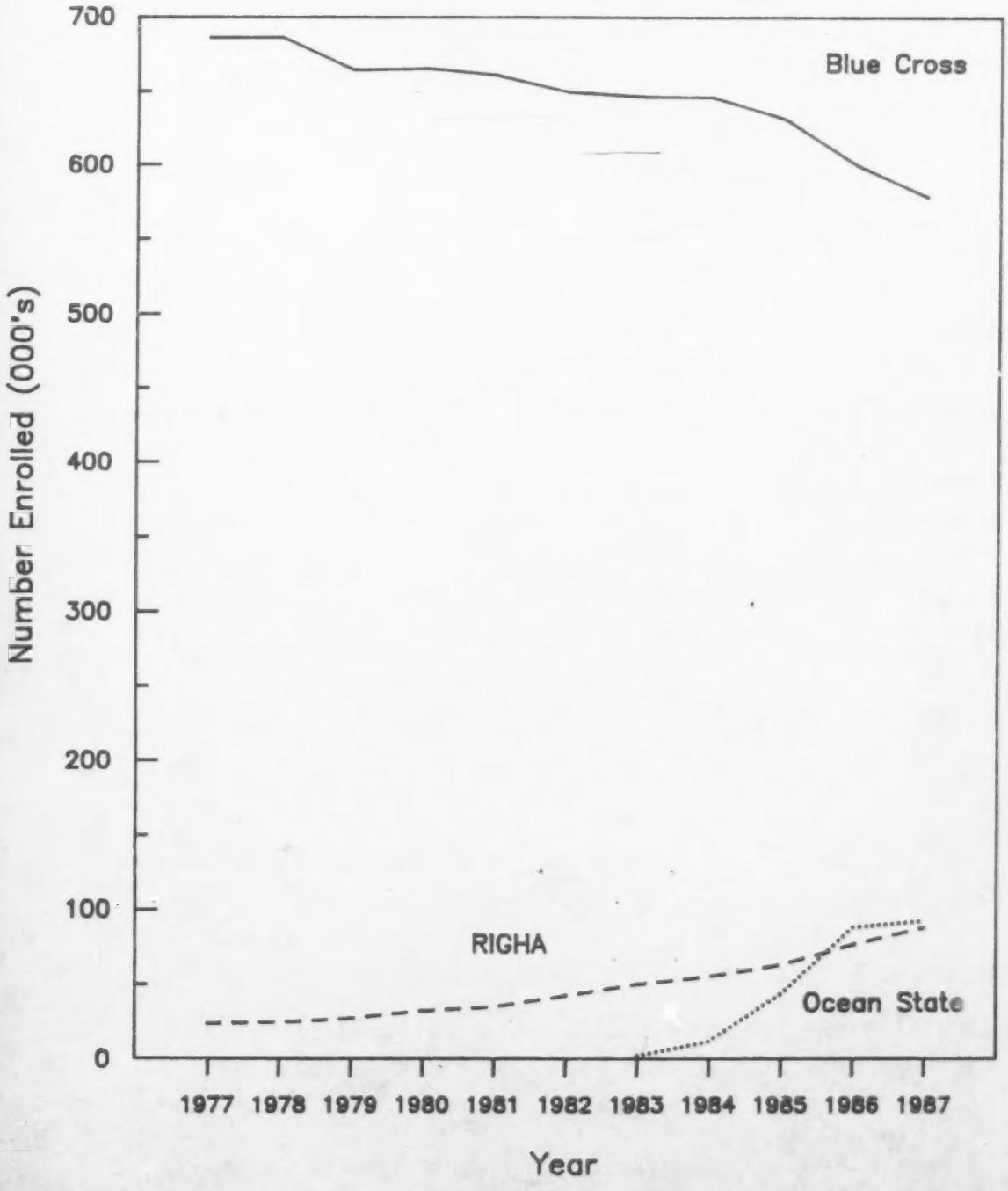
Assessing changing enrollment is hampered by out-of-state enrollment of unknown number in these health plans and by multiple or duplicated coverage of individuals. For example, a sizeable

*Includes out-of-state residents in enrolled populations.
+Figures provided by Blue Cross/Blue Shield of Rhode Island in letter of 3/1/89.
^Source for these items is a letter, 2/24/89, from Ocean State Physicians Health Plan.
~Data reflect first month's enrollment.

proportion of reported Rhode Island HMO members (an estimated five percent of Ocean State and 29 percent of RIGHA membership in 1988) are Massachusetts residents. Moreover, although Blue Cross numbers are revised to exclude enrollees in Plan 65, whose coverage is primarily supplemental to Medicare, the extent of other multiplan enrollment is unknown.

Nonetheless, the figures strongly suggest that the growth in HMO membership has cut into Blue Cross enrollment. Blue Cross membership declined by 16 percent from 1977 to 1987 at a time when the population of Rhode Island grew by over three percent. During the same period, total enrollment in Ocean State and RIGHA swelled by over 670 percent. When adjustment is made for out-of-state enrollment in the HMOs (approximately 30,000 Massachusetts residents are estimated to have been enrolled in Ocean State and RIGHA in 1987), estimated in-state membership can be seen to have grown by over 500 percent during this period. As these three health plans served about 75 percent of the Rhode Island population in both 1977 and 1987, it seems most logical that these three health plans primarily enroll from the same pool of eligibles, that is, that many or most of the new HMO members previously had been Blue Cross enrollees.

Selected Health Plan Enrollment in Rhode Island, 1977–1987



VI. Average Length of Stay in Short-term Hospitals

Introduction of the Medicare Prospective Payment System (PPS), inaugurated in late 1983 and in full operation in 1985, has been credited with a reduction in the average length of stay (ALOS) in short-term hospitals nationally for non-Medicare in addition to Medicare patients. In Rhode Island, PPS may be related to a decline in the length of hospital stays. Between 1982 and 1986, ALOS for medical/surgical services declined by nearly two days.

In pediatric and obstetrical/gynecological services, on the other hand, to which PPS Diagnostic Related Groups (DRGs) do not apply, ALOS has been stable. In 1987, the average patient obtaining ob/gyn services stayed under half a day less than her counterpart in 1977.

More striking, in the residual category "other" services, which incorporates psychiatric, rehabilitative, and pre/post acute care (some of the more "chronic" services provided in short-term hospitals), ALOS rose by nearly 100 percent between 1977 and 1987, from less than six days to nearly 11 days. Some of this change may reflect changes in the composition of services in the category over time.

Table 6. Average Length of Stay in Rhode Island Short-term Hospitals by Type of Service, 1977-1987

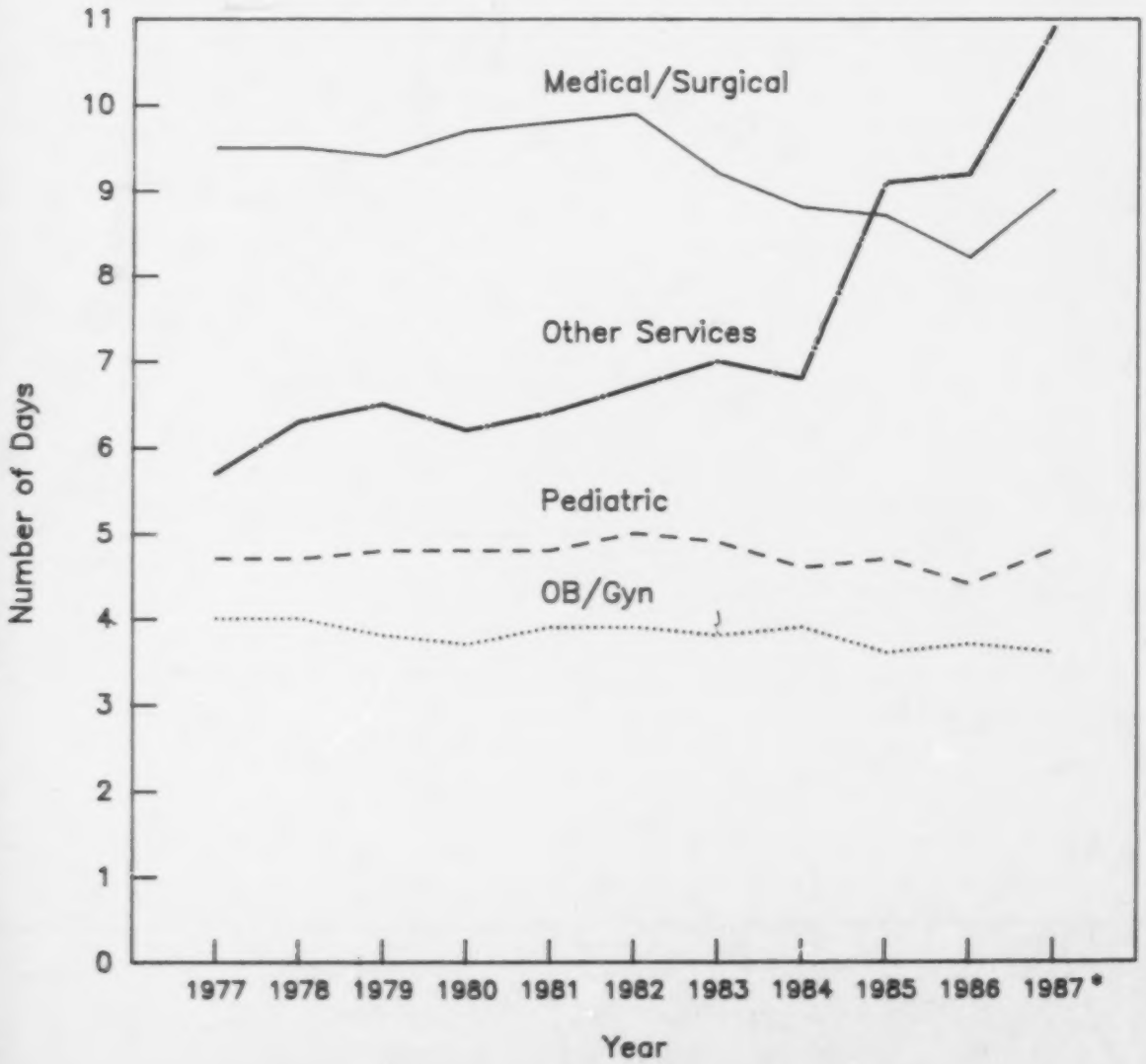
	Average Stay in Days										
Service	1987*	1986	1985	1984	1983	1982	1981	1980	1979	1978	1977
Medical/Surgical	9.0	8.2	8.7	8.8	9.2	9.9	9.8	9.7	9.4	9.5	9.5
Pediatric	4.8	4.4	4.7	4.6	4.9	5.0	4.8	4.8	4.8	4.7	4.7
OB/Gyn	3.6	3.7	3.6	3.9	3.8	3.9	3.9	3.7	3.8	4.0	4.0
Other Services	10.9	9.2	9.1	6.8	7.0	6.7	6.4	6.2	6.5	6.3	5.7

Moreover, ALOS also rose in medical/surgical, pediatric, and "other" services between 1986 and 1987. Medical/surgical and pediatric ALOS increased by ten percent between these years, and

*Figures for 1987 are estimated from the Interagency Hospital Data System report for fiscal year 1987 (10/86-9/87).

"other" services ALOS rose by nearly two days. It is unknown to what extent this increase in hospital stays can be attributed to patients awaiting placement in long-term care facilities (see Campbell, 1988b).

Average Length of Stay in Short-term Hospitals by Type of Service, Rhode Island, 1977-1987



* Figures for 1987 are estimated from the IHDS report for Fiscal Year 1987.

VII. Short-term Hospital Costs per Diem

The rising cost of hospitalization can be seen in the line in the figure on the next page showing the price in current dollars per day for an inpatient stay. Between 1980 and 1986 the per diem cost rose $38 on average each year (an average annual increase of 11 percent), so that from 1980 to 1986 the daily hospital cost climbed 87 percent. In 1987 however inflation took a decided turn downwards, from 8.5 percent growth between 1985 and 1986 to a 3.5 percent increase between 1986 to 1987.

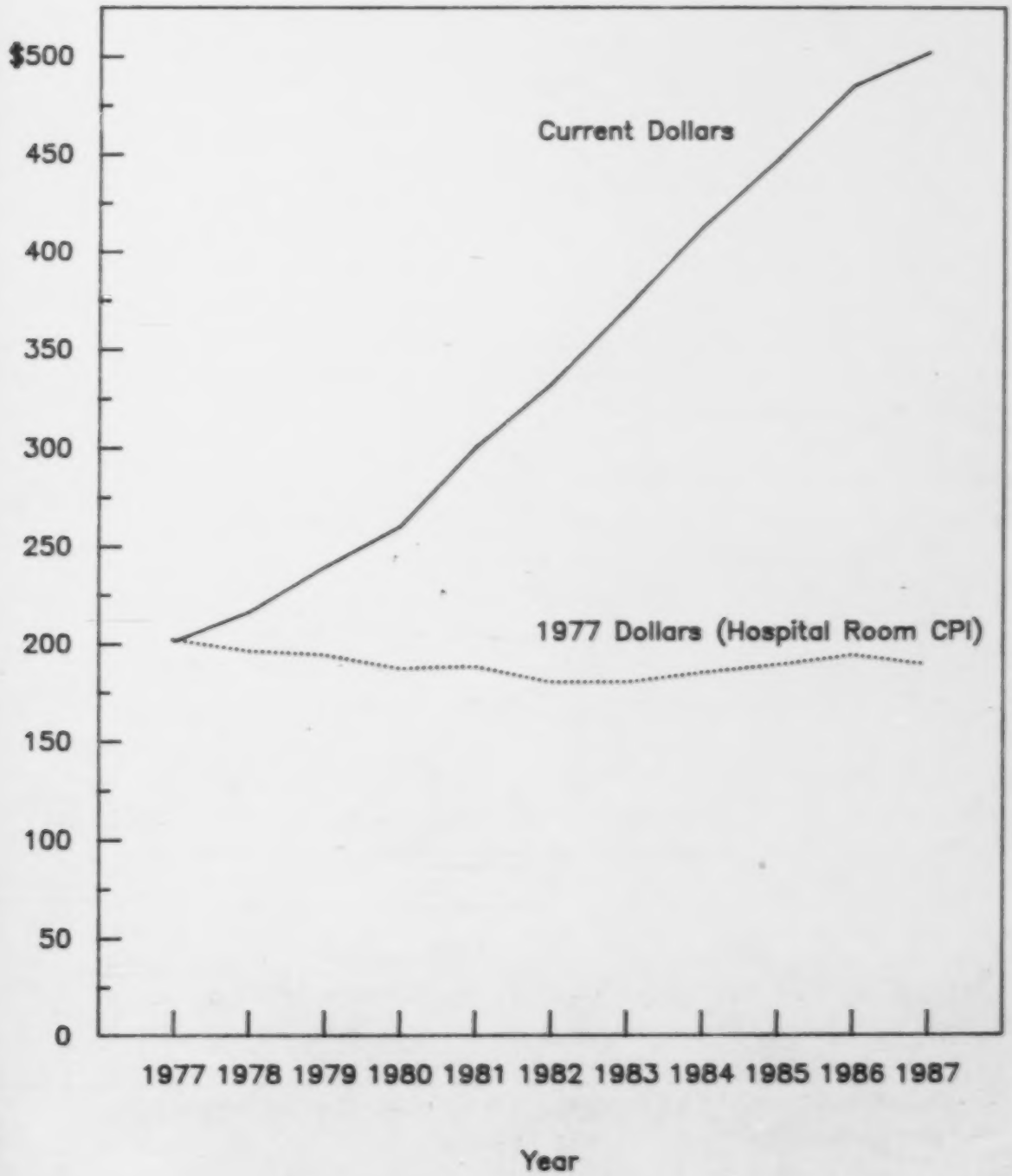
Table 7. Cost per Diem of Inpatient Stay in Short-term Hospitals in Rhode Island, 1977-1987

	Year										
Dollars	1987	1986	1985	1984	1983	1982	1981	1980	1979	1978	1977
Current	$502	$485	$447	$412	$371	$332	$300	$260	$239	$216	$201
Constant (1977-100)	188	193	188	184	179	179	187	186	193	195	201

The dotted line in the figure on the next page indicates hospital costs in Rhode Island controlling for inflation in the national consumer price index for a hospital room (dollars in 1977 are the unit). It can be seen that Rhode Island hospital costs have been remarkably stable over the time period when the changing costs of a hospital room nationally are adjusted. In fact, although hospital costs were 16 percent higher in Rhode Island than in the United States in 1977, the average inpatient cost per diem was seven percent lower in Rhode Island than in the nation as a whole by 1987.

Some of the factors that may be associated with this control over costs include the negotiated cap on growth in costs ("maxi-cap"), regulation through Certificate of Need, and the requirement for 20 percent equity to finance capital projects (33 percent in equipment). More remarkably, Rhode Island has kept growth in hospital costs below the national average despite historically higher labor costs in the Northeast.

Average Daily Cost of Inpatient Care in Short-term Hospitals, Rhode Island, 1977-1987



REFERENCES

Campbell, Miriam K., 1988a, Licensed Practical and Registered Nurses in Rhode Island in 1987, Rhode Island Department of Health.

Campbell, Miriam K., 1988b, Rhode Island Short-Stay Hospital Patients Awaiting Placement, Rhode Island Department of Health.

Campbell, Miriam K., 1987, Nonfederal Physicians Providing Patient Care in Rhode Island in 1984, Rhode Island Department of Health.

Campbell, Miriam K., Margaret C. Reilly and Jay S. Buechner, 1986, Rhode Island Health Interview Survey 1985 Summary Report, Rhode Island Department of Health.

Centers for Disease Control, 1986, "Trends in mortality from cirrhosis and alcoholism--United States, 1945-1983," JAMA, Vol. 256, 24, December 26: 3337-3338.

National Center for Health Statistics, 1978, International Classification of Diseases 9th Revision Clinical Modification, Commission on Professional and Hospital Activities: Ann Arbor, Michigan.

National Center for Health Statistics, 1988, Health, United States, 1987, DHHS Pub. No. (PHS) 88-1232, Washington: U.S. GPO.

Office of Health Planning, n.d., "Report on supply/need/demand for Rhode Island nursing personnel, 1988-2000, draft proposal," Rhode Island Department of Health.

Office of Health Statistics, 1989, Rhode Island Health Data Guide 1988, Rhode Island Department of Health.

Rhode Island Department of Health, 1988, Vital Statistics Annual Report 1986, Rhode Island Department of Health.

United States Department of Health and Human Services, 1989, Reducing the Health Consequences of Smoking: 25 Years of Progress. A Report of the Surgeon General, DHHS Pub No (CDC) 89-8411, Prepublication version, January 11.

APPENDIX

The following International Classification of Diseases, 9th Revision (ICD-9) codes were associated with the causes of death described in this report (National Center for Health Statistics, 1978):

Cause of Death	ICD-9 Code
Diseases of the Heart	390-398,402,404-429
Malignant Neoplasms	140-208
Cerebrovascular Diseases	430-438
Chronic Obstructive Pulmonary Disease	490-496
Diabetes Mellitus	250
Chronic Liver/Cirrhosis	571
Accidents and Adverse Effects	E800-E949
Motor Vehicle	E810-E825
Suicide	E950-E959
Homicide and Legal Intevention	E960-E978